CHAPTER V

GEOLOGY AND SUBSIDENCE

PARTS **Page**

APPENDICES

PLATES

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Refer to Record No 0091 Date 10-12-07
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For additional information

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V.B SUBSIDENCE

This part of Chapter V covers all of the issues associated with subsidence. Other chapters refer to this part when information concerning subsidence is required.

A comprehensive presubsidence survey of the permit area was done by Valley Engineering, Inc. and is appended to this part. Subsequent updated pre-subsidence surveys will be completed for all future panels where full extraction (planned subsidence) is contemplated. The reports will be submitted to DOGM three months prior to initiating full extraction.

V.B.1 Subsidence Control, Monitoring and Mitigation

UMC 783.24 (d), (e). (h)

Plates V-1, V-2, and V-3, of Appendix V-3 (Presubsidence Survey) show the manmade features within and adjacent to the permit area, which are not associated with the mining operation. Each feature or structure is coded on the maps and described in the narrative. Plates II-I, II-2, IV-3, and IV-18, show the manmade structures associated with the mining operation. Each structure is coded on the maps and described in the narrative of Chapter II. The designs for the various structures are detailed in Chapters IV and VI.

UMC 784.16 (a)(l)(iv)

Past underground mining has taken place beneath three structures in this category. They are Pond #I (mine discharge sedimentation pond), Pond #4 (reverse osmosis discharge collection pond), and Pond #5 (preparation plant area sedimentation pond). A small amount of subsidence would not have a significant effect on these ponds.

Pond #1, the largest, is an incised structure with heavily rip-rapped berms and concrete inlet/outlet structures*

Pond #I is the only impoundment containing an appreciable amount of water and it is a large distance from any public or private structure. Any discharge would be to an unnamed tributary of Quitchupah Creek. All three impoundments overlie mains and submains entries with relatively shallow overburden depths (less than 200 ft) and thus subsidence is not likely. The potential for downstream material damage due to subsidence is very low.

UMC 784.20

Appendix V-3 contains a presubsidence survey, performed by Valley Engineering, Inc. in 1980. Since that time, no structures have been added or removed. This document is therefore still used as baseline information.

Since the presubsidence survey shows that subsidence could cause material damage to structures and renewable resource lands, the following information is included for Parts (a),(b),(c), and (d) of this regulation.

3. The effects of mitigation work on non-renewable resources -The best example of this situation is the case where it is necessary to regrade an area to mitigate the effects of subsidence. If it is necessary to remove the topsoil prior to regrading, it would be better to wait until all probable subsidence had occurred than to risk topsoil contamination through repeated removal and respreading of the topsoil should subsidence continue for several years. However in this case, it may be necessary to perform lesser or temporary mitigative work to minimize the effects of pending water on the soil resources or hazardous conditions for people, wildlife or livestock.

As discussed above, we do not believe it is possible to commit to a specific timetable for performing subsidence mitigation. However, when subsidence mitigation is required by applicable laws and regulations, mitigation will be performed as soon as practical taking into consideration the above items.

UMC 817.126

As described in the subsidence control plan, under UMC 784.20, the two (2) perennial streams in the permit area will be protected by buffer zones (Refer to Plate V-5). There are no impoundments of 20 acre-feet or more in the permit area.

Underground water rights described in Chapter VI, under UMC 784.14, show that the Town of Emery maintains two (2) wells developed in different aquifers within the Ferron Sandstone formation. These wells are used as a backup water source to the town's present water supply system which relies on surface water from Muddy Creek. Emery Town Well No. 1 is developed in the Lower Ferron aquifer, which lies well below current mining activities. Well No. 2 is developed in the Middle and Upper Ferron aquifers which are directly below and above the seam being mined. No adverse impacts to either well are anticipated since the wells are located about 3 to 4 miles from the mine and are up gradient within the regional ground water flow pattern. If mining activities adversely impact the Emery Town Wells, Consol will commit to insuring an alternative source of water , per R645-301-731-530, for the town if the surface water supply becomes inadequate. Static water level readings taken from wells maintained as part of the mine's ground water monitoring program also indicate that no disruption of the aquifers in the vicinity of the town's wells has occurred.

Underground operations at the Emery Mine are not conducted beneath or in close proximity to any public buildings, including churches, schools, hospitals, court houses, and government offices.

Revised 10/07

PRE-SUBSIDENCE SURVEY
PRIOR TO FULL EXTRACTION AT THE
ZERO NORTH, 4th EAST MAINS, AND 6th WEST PANELS

Prepared for

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October 2007

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SECTION 1

INTRODUCTION

The purpose of this report is to present baseline surface conditions prior to full extraction operations at the Zero North, 4th East Mains, and 6th West Panel in the Consolidation Coal Company (CONSOL) Emery Mine, Emery County, Utah. It is intended to be part of a Subsidence Control Plan as required in Section R645-301-525.100 of the Utah Administrative Code. Recording initial surface conditions will facilitate locating and mitigating any areas determined to be adversely affected by future subsidence. As part of the pre-subsidence survey, the locations and conditions of the following features were recorded:

- Structures (e.g. buildings, corrals, roads)
- Fences
- Utilities (e.g. power, telephone, gas, and water lines, water wells)
- Surface drainages (e.g. natural channels, irrigation ditches)

This report references the original Pre-subsidence Survey performed prior to mining operations in 1980 (Valley Engineering, 1980). The feature numbers given in this document correspond to those described in the 1980 report. These features were surveyed in the field in October 2007, and any differences and/or changes from the conditions noted during the 1980 survey are noted both in the text and figures of this document. This report supercedes the Valley Engineering survey where conflicts exist.

CHAPTER 2
SURVEY AREA OBSERVATIONS

2.1 GENERAL AREA DESCRIPTION

This pre-subsidence survey covers approximately 142 acres, consisting of mostly undeveloped rangeland. Approximately 9.1 acres of the surveyed area are irrigated crop land. There are no structures located above the Zero North, 4th East Mains, or the 6th West Panel, but a small shed and corral is located nearby. Both of these structures are in dilapidated condition. There are several fences in the area in various states of repair. Most of the fences consist of barbed wire strung between posts made from natural rough cut tree limbs. Some fences use finished lumber fence posts or metal tee-stakes. A paved road which serves as the access road for the 4th East Portal traverses roughly west to east across the southeastern corner of the 4th East Mains. Unimproved roads stem from the paved road to the irrigated croplands in the survey area. There are one perennial drainage and several ephemeral drainages in the survey area. The perennial drainage is named Christiansen Wash. An overhead electrical power line traverses through the western portions of both the 4th East Mains and 6th West Panel. All of the features (structures, fences, roads, drainages, utilities, etc.) located during the pre-subsidence survey are shown on Figure 1. CONSOL has signed a County Road Repair Agreement with Emery County to mitigate any subsidence damage to roads within the full extraction area. Similarly, CONSOL has entered into a Power Line Repair Agreement with Pacificorp to mitigate subsidence damage to power lines within the full extraction area.

2.2 INDIVIDUAL FEATURE DESCRIPTIONS

Each numbered feature on Figure 1 is described below. The numbers for each feature are identical to those used in the 1980 Pre-Subsidence Survey. Refer to Section 6 for photographs.

Feature 85. Dirt Road and Fences. This feature is essentially unchanged from how it is described in the Valley Engineering (1980) report, which states the following: "The road is a two-track, single lane, dirt road. The road surface consists of the natural sand and clay that is in the area, and has been compacted by vehicles that travel the road. The fences in the area are barbed wire with either natural rough cut wood posts or steel posts." The fences are in fair to good condition.

Feature 86. Barbed Wire Fence. This feature has been updated from the Valley Engineering (1980) report. The fence, which is constructed with rough cut timber posts, is in dilapidated condition. Several of the posts are missing, and many of the barbed wire strands are loose and partially buried under the ground surface.

Feature 87. Small Creek and Fence. The description of this feature has been updated from the Valley Engineering (1980) report. The fence is constructed of rough cut timber posts and barbed wire and is in good condition. The "small creek" was incorrectly identified in the 1980 survey. The survey area is relatively flat, dry, and contains no established stream channels. The 1980 survey shows several irrigation ditches overlying the Zero North Panel which drain toward this "stream channel," which was actually an irrigation outflow ditch. During the 2007 survey, it was evident that many of the irrigation ditches had been allowed to fill in, including the "stream channel" identified in the 1980 survey.

Feature 88. Small Fenced Area. The description of this feature has been updated from the Valley Engineering (1980) report. It has fallen into disrepair since it was surveyed in 1980. The fenced area measures approximately 25 feet by 25 feet. Many of the fence posts are no longer straight, and the barbed wire sags. The area in the vicinity of the fence is overgrown with vegetation.

Feature 89. Quarter Section Marker. This feature remains the same as described in the Valley Engineering (1980) report, which states the following: "This quarter section corner marker is in Range 6 East Township 22 South. It divides sections 22 and 27. The marker is a metal cap on a short steel pipe."

Feature 90. Ponds. The description of this feature has been updated from the Valley Engineering (1980) report. The ponds were empty during the October 2007 survey, but four earth berms were present that appeared capable of impounding water. The berms are approximately 3 feet tall. Three of the berms are clustered together in a north to south alignment, and one berm is located a few hundred feet to the northeast. A dry irrigation ditch located west of the three clustered ponds appears to serve as a water source. A dilapidated wooden corral and small shed is located just north of the three clustered ponds.

Feature 91. Sixteenth Section Corner Marker. This feature remains the same as described in the Valley Engineering (1980) report, which states the following: "The marker is located in Range 6 East Township 22 South and divides the south boundary of the southwest quarter of Section 22 between sections 22 and 27. The marker is a short steel pipe, about a foot in height, with a metal cap at the top."

Feature 92. Fence and Dirt Road. The description of this feature has been updated from the Valley Engineering (1980) report. This feature is in fair to poor condition. The road is rutted and overgrown with vegetation, especially where irrigation runoff discharges from the center of the field located to the north. The fence, which is constructed from rough cut timber and barbed wire, is also overgrown by grasses. Many of the fence posts are no longer plumb, and many of the barbed wire strands sag.

Feature 93. Irrigation Ditches and Farmland. The description of this feature has been updated from the Valley Engineering (1980) report. The portion of this feature that overlies the

6th West Panel (it does not exist above the 4th East Mains) contains two irrigated fields with a total of 9.1 acres of cultivated land. The northwestern field drains to the south/southeast and receives irrigation water from a ditch running along its eastern edge. The southeastern field drains to the south and receives irrigation water from a ditch that enters the field from the north.

Feature 96. Cattle Guard. The description of this feature has been updated from the Valley Engineering (1980) report. The cattle guard was not present during the October 2007 survey.

Feature 97. Dirt Road, Utility Power Line, and Fence. The description of this feature has been updated from the Valley Engineering (1980) report. The dirt road is approximately 24 feet wide with a surface constructed from imported, compacted gravel. The road is in very good condition. The utility power line hangs from 30 to 40 foot tall wooden poles, and is in very good condition. The poles appear relatively plumb. The barbed wire fence is located on the west side of the road and has posts constructed from rough cut timbers and metal tee-stakes. The fence is in good to excellent condition.

Feature 98. Small Creek. The description of this feature has been updated from the Valley Engineering (1980) report. The creek is called Christiansen Wash. During the October 2007 survey, flow in the creekbed was approximately 3 feet wide. The creek flows to the southwest and discharges into Quitchupah Creek. The creek flows under the paved access road for the 4th East Portal via a 60-inch diameter coated corrugated steel pipe that is in very good condition.

Feature 103. Farm Land, Corrals, Ponds, and Fences. The description of this feature has been updated from the Valley Engineering (1980) report. Most of this feature lies just outside the boundaries of the 4th East Mains and 6th West Panel. However, a fenced and gated hay storage area is located just to the northwest of the 6th West Panel. The fence and gate are in good

condition. An unimproved dirt road (good condition) leads from the gravel road up to the hay storage area.

SECTION 3
CONCLUSIONS

This report summarizes pre-subsidence surface conditions for the Zero North, 4th East Mains, and 6th West Panel at the Consolidation Coal Emery Mine, Emery County, Utah. Surface features were inspected and surveyed in October 2007 prior to full extraction. Although the damage due to subsidence is generally expected to be limited, the greatest potential for adverse effects would likely be disturbances to surface drainages, roads, and utilities. By detailing pre-subsidence conditions in this report, it will be easier to both identify and mitigate negative impacts caused by future subsidence.

SECTION 4

REFERENCES

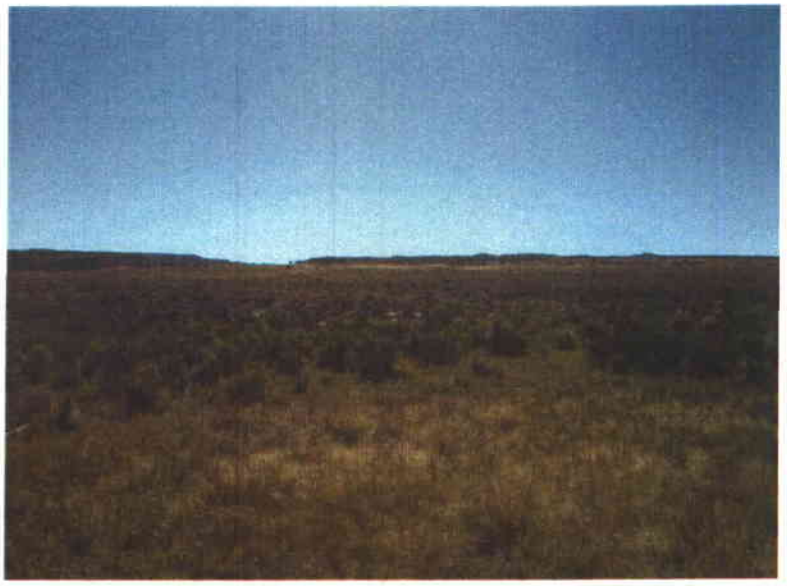
Consolidation Coal Company, 1990. Emery Mine Permit Act 015/015 Renewal. Chapter VI Volume 1 Section VI.A.3. Submitted to Division of Oil, Gas, and Mining September 9, 1990.

Valley Engineering, Inc., 1980. Consolidation Coal Company, Emery Mine, Presubsidence Survey, Structure and Renewable Resources Descriptions. Division of Oil, Gas, and Mining, Emery Permit 015/015. Chapter V, Vol. 2 of 3.

FIGURE 1

SITE PHOTOGRAPHS

Corners of Sections 22, 23, 26, and 27. Looking west at the ground surface above the Zero North Panel. USGS bench marker is visible where fences intersect. Note that the fence is constructed of unfinished timbers and is in fair condition.



View looking south near the center of the Zero North Panel. The ground surface is relatively

flat, and is not currently used for crop production.

Feature 85. Dirt Road and Fences. Looking east. Fence is constructed from rough cut timbers and is in good condition. The road is an unsurfaced two track road and is in good condition.

Feature 86. Barbed Wire Fence. Looking west at the fence that extends to the north from the point labeled Feature 86 on Appendix V-5 Figure 1. The fence is missing several of its rough cut timber posts, and is in poor condition.

Feature 86. Barbed Wire Fence. Looking south along the fence that extends to the north from the point labeled Feature 86 on Appendix V-5 Figure 1.

Features 86, 87. Barbed Wire Fence, Small Creek and Fence. Looking southwest. Fence is constructed from rough cut timbers and is in good condition. The small creek identified in the 1980 survey was not present in 2007.

Remnant irrigation ditch in northern portion of Zero North Panel. Note the partially buried piping in the foreground. This was the only irrigation ditch that was identified in 2007, and it is in dilapidated condition.

Paved Access Road to 4th East Portal. Looking southeast along road. The 4th East Portal is visible in the distance.

4th East Mains South of Paved Access Road. Looking South. Note Christiansen Wash on far right of photo. The land surface is undeveloped.

Feature 88. Small Fenced Area. Looking east.

Feature 89. Quarter Section Corner Marker.

Feature 90. Ponds. Looking southeast at southern pond.

Feature 90. Ponds. Looking southeast at central pond.

Feature 90. Ponds. Looking southeast at northern pond.

Feature 90. Ponds. Looking southeast at northeastern pond.

Feature 90. Ponds. Looking north at a nearby dilapidated corral and small Shed.

Feature 90. Ponds. Looking west at a nearby small Shed.

Feature 92. Fence and Dirt Road. Looking east. Note that road and fence are overgrown and in fair to poor condition.

Feature 93. Irrigation Ditches and Farmland. Looking south at the northern field.

Feature 93. Irrigation Ditches and Farmland. Looking south at the southern field.

Feature 97. Dirt Road, Utility Power Line, and Fence. Looking north from a point just north of where the dirt road crosses Christiansen Wash.

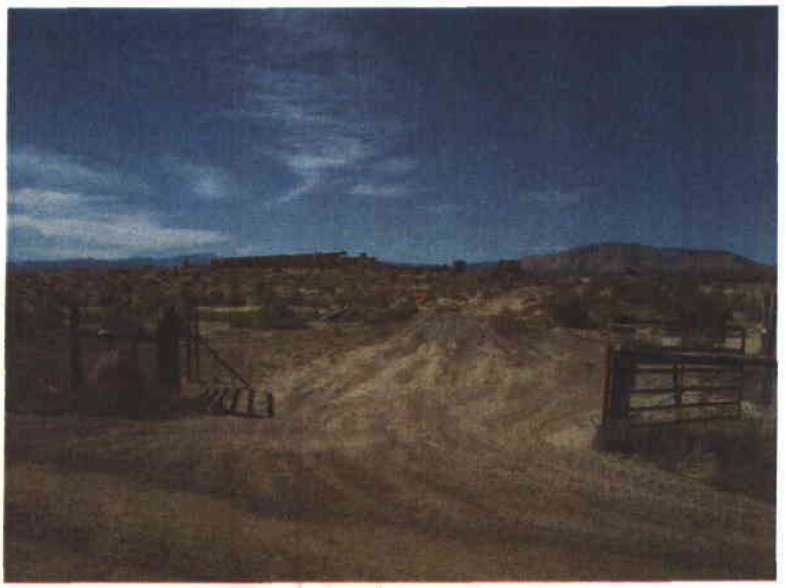
Feature 97. Dirt Road, Utility Power Line, and Fence. Looking north. Note that Feature 103 is visible in the distance.

Feature 97. Dirt Road, Utility Power Line, and Fence. Looking west at fence and power line.

Feature 97. Dirt Road, Utility Power Line, and Fence. Looking south from road junction in Panel 6W. The 4th East Portal is visible in the distance.

Feature 98. Small Creek. Looking south from where the creek intersects the graded gravel road. Note the embankment for the paved access road for the 4th East Portal along the horizon. This small creek is called Christiansen Wash. During the October 2007 survey, the stream was flowing about 3 feet across.

Feature 98. Small Creek. Looking south at the 60-inch diameter coated corrugated metal pipe that conveys Christiansen Wash under the paved access road for the 4th East Portal.



Feature 103. Farm Land, Corrals, Ponds, and Fences. Looking west at a hay storage area.